

FORM PTO-1390 OFFICE (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK		ATTORNEY'S DOCKET NUMBER 46500-000102
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>107088134</b>		NEW
		EXPRESS MAIL LABEL NO. <b>107088134</b>		
INTERNATIONAL APPLICATION NO. PCT/KR00/00215	INTERNATIONAL FILING DATE March 15, 2000	PRIORITY DATE CLAIMED September 16, 1999		
TITLE OF INVENTION DEVICE FOR EXHAUSTING IN VACUUM CLEANER				
APPLICANT(S) FOR DO/EO/US Heon Pyeong JI and Sang Jun PARK				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<p>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).</p> <p>4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))           <ul style="list-style-type: none"> <li>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). WO 00/</li> <li>b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ul> </p> <p>6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).           <ul style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> is transmitted herewith.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4)</li> </ul> </p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).           <ul style="list-style-type: none"> <li>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> have been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ul> </p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>				
Items 11. to 20. below concern document(s) or information included:				
<p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98-1449 and International Search Report (PCT/ISA/210) in German with () references.</p> <p>12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.</p> <p>14. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> <p>20. <input checked="" type="checkbox"/> Other items or information:           <ul style="list-style-type: none"> <li>1) Thirteen (13) sheets of Formal Drawings</li> <li>2) International Preliminary Examination Report (PCT/IPEA/409)</li> <li>3) PCT Demand (PCT/IPEA/401)</li> <li>4) PCT Request (PCT/RO/101)</li> </ul> </p>				

LOCATION NO. (if known, see 37 CFR 1.5)

106088134

INTERNATIONAL APPLICATION NO.

PCT/KR00/00215

ATTORNEY'S DOCKET NUMBER

46500-000103

21.  The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5):**

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$600.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1) (4) \$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT -

Surcharge of \$130.00 for furnishing the oath or declaration later than  20  30 months from the earliest claimed priority date (37 CFR 1.492(c))

months from the earliest claimed priority date (37 CFR 1.492(e)).			
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total Claims	23 - 20 =	3	X \$18.00 \$ 54.00
Independent Claims	1 - 3 =	0	X \$84.00 \$ 0
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00 \$
<b>TOTAL OF ABOVE CALCULATIONS = \$</b>			
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. <b>SUBTOTAL = \$</b>			
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). <b>TOTAL NATIONAL FEE = \$</b>			
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property <b>TOTAL FEES ENCLOSED = \$ 1,134.00</b>			
<input checked="" type="checkbox"/> Amount to be: refunded <input type="checkbox"/> charged \$			

- a.  A check in the amount of \$1,134.00 to cover the above fees is enclosed.
- b.  Please charge my Deposit Account No. 08-0750 in the amount of \$ to cover the above fees.  
A triplicate copy of this sheet is enclosed.
- c.  The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-0750.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

Send all correspondence to:

**Harness, Dickey & Pierce, P.L.C – Customer No.  
Post Office Box 8910  
Reston, Virginia 20195**

Date: March 15, 2002

*[Signature]*

Terry L. Clark, Reg. No. 32,644

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: NEW

Filing Date: March 15, 2002

Applicant: Heon Pyeong JI et al.

Group Art Unit: Unassigned

Examiner: Unassigned

Title: DEVICE FOR EXHAUSTING IN VACUUM CLEANER

Attorney Docket: 46500-000102

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PRELIMINARY AMENDMENT

**BOX PATENT APPLICATION**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

March 15, 2002

Dear Sir:

The following Preliminary Amendments and remarks are respectfully submitted in connection with the above-identified application.

IN THE SPECIFICATION

Please amend the specification as follows.

Before line 1, insert --This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/KR00/00215, which has an International filing date of March 15, 2000, which designated the United States of America.--

**IN THE CLAIMS**

Please amend the following claims.

8. (Amended) The device as claimed in claim 5, wherein the guiding member and the grip portion are separately formed and are integrated.

9. (Amended) The device as claimed in claim 5, wherein the guiding member and the grip portion are integrally formed.

Please add the following new claims.

22. (New) The device as claimed in claim 7, wherein the guiding member and the grip portion are separately formed and are integrated.

23. (New) The device as claimed in claim 7, wherein the guiding member and the grip portion are integrally formed.

2025 RELEASE UNDER E.O. 14176

**REMARKS**

The specification has been amended to provide a cross-reference to the previously filed International Application.

Claims 8 and 9 have been amended and claims 22 and 23 have been added to remove multiple dependencies.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

Favorable action on the above-identified application is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment of Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

Harness, Dickey & Pierce, P.L.C

By   
Terry L. Clark, Reg. No. 32,644

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TLC/bab

Attachment

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS**

The claims have been amended as follows.

8. (Amended) The device as claimed in [one of claims] claim 5 [or 7], wherein the guiding member and the grip portion are separately formed and are integrated.

9. (Amended) The device as claimed in [one of claims] claim 5 [or 7], wherein the guiding member and the grip portion are integrally formed.

Claims 22 and 23 are new.

## DEVICE FOR EXHAUSTING IN VACUUM CLEANER

### Technical Field

The present invention relates to a vacuum cleaner, and more particularly, a  
5 device for exhausting in a vacuum cleaner for exhausting air which flows inside a  
vacuum cleaner to outside thereof.

### Background Art

Generally, a vacuum cleaner generates a suction force when cleaning a house, a car etc., to remove foreign matters such as dusts by the suction force.

10 Referring to Figs. 1 and 2, the vacuum cleaner includes a main body 10 having a dust collecting bag 11 therein, and a suction nozzle 20 connected to the main body 10 for suction of interior air and various foreign matters. A suction hose 31, a grip portion 32, and an extension pipe 33 are sequentially connected between the suction nozzle 20 and the main body 10, for guiding the foreign matters drawn  
15 through the suction nozzle 20 to the dust collecting bag 11. Additionally, a fan 13 which is rotated by a driving force of a motor is mounted inside the main body 10.

The air which is drawn to inside of the main body 10 of the vacuum cleaner passes through the dust collecting bag 11 and is exhausted through a plurality of exhaust holes 14 formed at rear of the main body 10. At this instance, an air exhaust  
20 filter 15 is mounted at an inner part of the main body 10 at which the plurality of

exhaust holes 14 are formed, to collect fine dusts contained in the air exhausted through each exhaust hole 14.

Wheels 16 are rotatably mounted at both sides of the main body 10, for moving the vacuum cleaner to places to be cleaned.

5        The mounting structure of the wheel is shown in Figs. 3 and 4. As shown in the drawings, a hook 16a is formed at innermost of the wheel 16, and a projected locking portion 10a for mounting the hook 16a thereto is formed at outer surface of both sides of the main body 10. Accordingly, the wheels 16 are connected to the main body 10.

10        However, the aforementioned wheels 16 are merely for moving the main body 10 of the vacuum cleaner, and do not have any other functions. Additionally, the air exhaust filter 15 should be frequently replaced because it has to be maintained clean all the time.

15        Accordingly, it was quite cumbersome for a user to replace the air exhaust filter often and to disassemble the entire vacuum cleaner for replacing of the air exhaust filter. Additionally, the functions and designs of a vacuum cleaner are being improved recently. Moreover, the plurality of exhaust holes 14 formed at rear of the main body 10 is visually unpleasant because of the preconception that the air inside the vacuum cleaner is exhausted thereto, and variations to other shapes are limited.

Disclosure of Invention

Accordingly, the present invention is directed to a device for exhausting in a vacuum cleaner that substantially obviates one or more of the problems due to limitations and disadvantages of the related art. An object of the present 5 invention is to provide a device for exhausting in a vacuum cleaner, whose air exhaust filter can be easily replaced.

Another object of the present invention is to provide a device for exhausting in a vacuum cleaner, which reduces visual discomfort of a user by hiding the exhaust holes.

10 Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

15 To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, the device for exhausting in a vacuum cleaner includes a main body for suction and collecting of various contaminants, wheels rotatably mounted at both sides of the main body, an exhaust flow passage formed between the main body and the wheels, for discharging the air 20 cleaned inside the main body, and an air exhaust filter provided at the exhaust flow

passage for filtering the fine dusts contained in the exhausted air once again.

Brief Description of Drawings

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention:

In the drawings:

Fig. 1 is a perspective view showing the related art vacuum cleaner, schematically;

Fig. 2 is a cross-sectional view showing an inside of a main body of the related art vacuum cleaner;

Fig. 3 is a disassembled perspective view showing an assembling relationship between the related art main body of a vacuum cleaner and a wheel;

Fig. 4 is a cross-sectional view showing a main part of the wheel in Fig. 3 connected to the main body of the vacuum cleaner;

Fig. 5 is a disassembled perspective view showing a device for exhausting in a vacuum cleaner in accordance with a first embodiment of the present invention;

Fig. 6 is a cross-sectional view showing a main part of the wheels connected to the main body of a vacuum cleaner, having the device for exhausting of Fig. 5;

Fig. 7 is a disassembled perspective view showing a device for exhausting in a vacuum cleaner in accordance with a second embodiment of the present invention;

Fig. 8 is a cross-sectional view showing a main part of the wheels connected to the main body of a vacuum cleaner, having the device for exhausting of Fig. 7;

5 Fig. 9 is a disassembled perspective view showing a main part of a variation of a grip portion in accordance with the second embodiment of the present invention;

Fig. 10 is a disassembled perspective view showing a device for exhausting in a vacuum cleaner in accordance with a third embodiment of the present invention;

10 Fig. 11 is a cross-sectional view showing each component of Fig. 10 in an assembled state;

Fig. 12 is a disassembled perspective view showing a main part of a variation of a grip portion in accordance with the third embodiment of the present invention;

15 Fig. 13 is a disassembled perspective view showing a device for exhausting in a vacuum cleaner in accordance with a fourth embodiment of the present invention; and

Fig. 14 is a cross-sectional view showing each component of Fig. 13 in an assembled state.

<description on symbols for key parts of the drawings>

100: main body 101: exhaust hole

20 102: guiding projection 103: center axis

160: wheel                    161: air exhaust filter  
162: guiding member        163: rolling member  
164: grip portion

Best Mode for Carrying Out the Invention

5                    Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

Fig. 5 is a disassembled perspective view showing a device for exhausting in a vacuum cleaner in accordance with a first embodiment of the present invention. The first embodiment of the present invention suggests a device for exhausting, having 10 an exhaust flow passage formed between a main body 100 of the vacuum cleaner and wheels, and an air exhaust filter 161 integrally formed at the exhaust flow passage. The exhaust flow passage is formed by opening a portion at which wheels 160 of the main body 100, and the wheel 160. Additionally, a guiding projection 102 is formed 15 at an outer surface of the main body 100 at which the exhaust hole 101 is formed, for connecting the wheel 160.

The wheel 160 includes a guiding member 162 for receiving an air exhaust filter 161, and a rolling member 163 mounted around the guiding member 162 for performing a rolling movement when contacting a ground. The guiding member 162 is opened, and a rib 162a for preventing detachment and shaking of the air exhaust 20 filter 161 is formed at this opened portion.

The rolling member 163 has a plurality of projections 163a along an inner circumference thereof, thereby efficiently sliding around the guiding member. The rolling member 163 is generally made of soft materials for smooth contact and rolling on the ground, or it may be formed of other materials.

5        Additionally, at least one locking groove or locking hole 102a are formed around the guiding projection 102, and a locking means such as a protrusion 162b or a hook 162c is formed at an outer circumference of the guiding member 162. The protrusion 162b or the hook 162c of the guiding member 162 is locked to each locking hole 102a of the guiding projection 102, so that the wheel 160 and the main 10      body 100 are connected with each other.

At this instance, the protrusion 162b or the hook 162c is preferably formed at each corresponding portion along the circumference of the guiding member 162, for maintaining the connection between the main body and the wheel, and at the same time, easily detaching the wheel from the main body when necessary. The exhaust 15      holes which were conventionally formed at rear of the main body 100 of the vacuum cleaner are shut, thereby exhausting the air passed through the dust collecting bag 11 essentially to a side at which the wheel is formed.

Accordingly, a design at rear of the main body can be suitably modified by a user, and thus, the visual discomfort of a user can be reduced because the portion 20      to which the air is exhausted is not visible.

Fig. 6 is a sectional view showing the main part of the wheels connected to the main body, having a device for exhausting in accordance with a first embodiment of the present invention.

As shown in Fig. 6, the air exhausting filter 161 is inserted to be fixed 5 between an outer surface of the main body 100 at which the exhaust holes 101 are formed and the guiding member 162, and the guiding member 162 is connected to the guiding projection 102 formed at the main body 100 to be fixed thereto.

A rolling member 163 performing an actual movement of the main body of the vacuum cleaner is rotatably connected to an outer circumference of the guiding 10 member.

The operation of the first embodiment of the present invention will be explained in detail.

First, when a suction force is generated by a rolling of the fan 13, air and dusts sequentially pass through the suction nozzle 20, the extension pipe 33, the grip portion 32 and the suction hose 31, to be drawn into the dust collecting bag 11 provided within the main body 100. Then, the air containing only fine dusts passes the dust collecting bag 11 and flows inside the main body 100, by the continuous suction force. The air flowing inside the main body is then exhausted to outside of the main body 100 through the plurality of exhaust holes formed at one side of the 15 main body 100. At this instance, as the wheels having the air exhaust filter 161 is mounted at the outer surface of the main body at which the exhaust holes are formed, 20

the air and the fine dusts are filtered again at the air exhaust filter 161.

Accordingly, the air is exhausted and the fine dusts contained in the air are collected at the air exhaust filter 161.

The air exhaust filter should be replaced as the cleaning process is repeated.

5 When replacing the air exhaust filter 161 with a new one, the guiding member 162 connected to the guiding projection 102 of the main body 100 is simply detached with a force to an outer direction, thereby easily replacing the air exhaust filter 161 located between the guiding member and the guiding projection.

Meanwhile, the present invention is not limited to the aforementioned first 10 embodiment. That is, the present invention may be formed with such a structure that a user can replace the air exhaust filter easily.

Figs. 7 and 8 propose a shape of the device in accordance with a second embodiment of the present invention with which the air exhaust filter can be easily mounted and replaced. As shown in Fig. 7, a projected center axis 103 is integrally formed at a side of the main body 100 at which the exhaust holes 101 are formed, to penetrate the air exhaust filter 161 and the guiding member 162 of the wheel 160. At 15 the same time, the grip portion 164 selectively connected to the center axis 103 is mounted at an outer side of the guiding member 162 of the wheel 160, to fix the guiding member 162 to the guiding projection 102. Other parts in the structure are 20 same as those of the first embodiment.

In the aforementioned structure, a separate grip portion 164 is provided

instead of mounting the guiding member 162 directly to the guiding projection 102 using the hook 162b, and a projected center axis 103 is also formed separately at the side of the main body 100 to mount the grip portion 164. Accordingly, the air exhaust filter 161 can be easily detached when necessary.

5        Additionally, the protrusion 162b and the hook 162c formed at the outer circumference of the guiding member 162, and the locking hole 102a which was formed at the outer circumference of the guiding projection 102 are not necessary in accordance with the second embodiment of the present invention. That is, an end portion of the center axis 103 which is projected outwardly of the guiding member

10      162 is formed as a cylindrical shape having an empty space therein, and locking portions 103a are integrally formed along an inner circumference facing each other, to be projected inwardly of the center axis.

15      A connecting axis 164a which is inserted to inside of the center axis 103 is formed at the grip portion 164. The connecting axis 164a is provided with locking protrusions 164b which is locked to the locking portion 103a of the center axis 103 when the connecting axis 164a is inserted to the center axis 103 for preventing detachment thereof, thereby mounting the air exhaust filter 161 easily.

20      At this instance, each locking protrusion 164b of the grip portion 164 has an inclined surface whose width becomes narrow toward a rear of the grip portion 164, thereby inserting the locking protrusion t the rear of the locking portion easily.

That is, when the locking protrusion 164b is located within the locking

portion 103 and the grip portion 164 is rotated, the locking portion 103a passes the inclined surface of the locking protrusion 164b and is located at an inner portion thereof, thereby guiding the grip portion 164 to be completely inserted inside the center axis 103. At this instance, since a gap between the locking protrusion 164b and 5 a packing member 165 is narrower than the thickness of the locking portion 103a, the locking portion 103a is compressed between the locking protrusion and the packing member 165.

Additionally, a projected rotation preventing portion 103c is additionally formed axially at one end of the locking portion 103a, for limiting the rotation range 10 of the grip portion 164.

The packing member 165 is formed on the connecting axis 164a, between an inner wall of the guiding member 162 and the locking protrusion 164b of the grip portion 164 for sealing a gap therebetween. At this instance, the packing member is preferably formed of a comparatively flexible material, for sealing the gap at its 15 maximum.

The procedure of mounting the air exhaust filter having the aforementioned structure in accordance with the second embodiment of the present invention will be explained in detail.

First, the air exhaust filter 161 penetrates the center axis 103 projected at an 20 inner part of the guiding projection 102 at a side of the main body 100, and the guiding member 162 is mounted at an outer part of the air exhaust filter 161. Since

a hole 161a is formed at the center of the air exhaust filter 161 so that the center axis 103 can penetrate, the air exhaust filter 161 can be mounted as aforementioned.

At this instance, the connecting axis 164a of the grip portion 164 is inserted to the center axis 103 which is exposed through the center portion of the guiding member 162, and the grip portion 164 is rotated clockwise (or, counterclockwise) in the drawing to complete the connection. That is, when the grip portion 164 is rotated, the locking portion 103a formed at the center axis 103 passes the inclined surface of the locking protrusion 164b formed around the connecting axis 164a of the grip portion 164, and is gradually moved to an inner part of the locking protrusion 164b to be closer to an inner surface of the guiding member 162.

Accordingly, the packing member 165 mounted between the locking protrusion 164b and the guiding member 162 is gradually compressed to seal the space therebetween, thereby giving a fixing force in accordance with the connection of the locking protrusion 164b and the guiding member 162.

Additionally, when the locking protrusion 164a is locked at the rotation prevention portion 103c formed at the inner wall of the center axis 103 by a continuous rotation of the grip portion 164, the grip portion 164 cannot rotate any longer and is fixed with the fixing force of the packing member 165.

A projected, substantially  $\wedge$  shaped grip portion protrusion 164c is formed at a rear side which is exposed externally, so that a user can rotate the grip portion 164 easily grabbing the grip portion protrusion 164c. At this instance, the shape of

the grip portion protrusion is not limited to have the aforementioned shape, but can be formed with a "+" or an "I" shape. Additionally, as shown in Fig. 9, since the grip portion 164 is integrally formed at the guiding member 162, it is apparent to those skilled in the art that the guiding member can easily be mounted to and detached from 5 the guiding projection 102.

Meanwhile, Figs. 10 and 11 show a connecting relationship between the center axis formed at a side of the main body and the separate grip portion, in accordance with the third embodiment of the present invention. The structure of the third embodiment is almost same as that of the second embodiment, except the 10 connecting relationship between the center axis and the grip portion. That is, a plurality of screw threads 103b are formed at an outer circumference of an end portion which is projected outwardly of the guiding member, and a projected connecting axis 164a having screw threads 164d formed along its outer circumference is formed at the grip portion 164, thereby enabling easy mounting of 15 the air exhaust filter 161.

The procedure of mounting the air exhaust filter in accordance with the third embodiment of the present invention will be explained in detail.

First, the air exhaust filter 161 is mounted at the center axis 103 projected at a side of the main body which is an inner part of the guiding projection 102, and the 20 guiding member 162 is mounted around the outer circumference of the air exhaust filter 161. Since the hole 161a is formed at the center of the air exhaust filter so that

the center axis 103 can penetrate, the air exhaust filter 161 can be mounted as aforementioned.

At this instance, the connecting axis 164a of the grip portion 164 is inserted to the center axis 103 which is exposed through the center portion of the guiding member, and the grip portion 164 is rotated clockwise (or, counterclockwise) of the drawing to complete the connection. The grip portion 164 is not detached from the center axis 103 because the connecting axis 164a of the grip portion 164 is connected within the center axis 103 in a screwed type.

Additionally, a projected, substantially  $\wedge$  shaped grip portion protrusion 164c is formed at a rear side which is exposed externally, so that a user can rotate the grip portion 164 easily grabbing the grip portion protrusion 164c. At this instance, the grip portion protrusion is not limited to have the aforementioned shape, but can be formed with a "+" or an "I" shape. Additionally, since the grip portion 164 is integrally formed at the guiding member 162 as shown in fig. 12, it is apparent to those skilled in the art that the guiding member 162 can easily be mounted to and detached from the guiding projection 102.

Meanwhile, when a user wants to replace the air exhaust filter 161 or to detach it for cleaning thereof, the grip portion 164 is rotated counterclockwise (or, clockwise) of the drawing, which is opposite to the initial connecting direction, to detach the connecting axis 164a of the grip portion from the center axis 103. Then, the guiding member 162 is separated from the center axis 103, to detach the air

exhaust filter 161.

However, with the aforementioned structure, fine dusts passing through each exhaust hole 101 of the main body 100 contacts a side of the main body 100 and contaminate the portion. Accordingly, a user has to wipe or clean the entire side 5 portion of the main body 100 to remove the contaminants thereof. Considering that various circuit substrates are located inside the main body 100 of the vacuum cleaner, water may be flown into the main body 100 because of the cleaning of the side portion of the main body 100, as well as causing inconvenience for a user in that the main body 100 should be disassembled for cleaning the inner part thereof.

10 Figs. 13 and 14 shows a fourth embodiment of the present invention, to solve the aforementioned problem.

The fourth embodiment in accordance with the present invention proposes a device for exhausting in which a side portion of the main body 100 at which the wheel is located is completely opened, and the guiding projection 202, projected 15 toward the wheel and along whose outer circumference the rolling member 163 is mounted, is formed at the outer circumference of the opened portion. Additionally, a separate filter assembly 200 having an air exhaust filter 210 is mounted at the outside of the guiding projection 202.

At this instance, the filter assembly 200 is fixed to the main body 100 of the 20 vacuum cleaner with stability, using a bolt 104 or the like.

In the filter assembly 200, the center axis 220 which penetrates and supports

the air exhaust filter 210 is formed on a surface close to the main body 100, at the inner center thereof. A guiding member 230 for supporting the air exhaust filter 210 is mounted at the center axis 220 to prevent detachment of the air exhaust filter 210. At this instance, the guiding member 230 is fixed to the filter assembly 200 using the 5 grip portion 164 same as the aforementioned embodiments, and a rotation preventing portion 231 is additionally formed at the inner circumference of the guiding member 30 for compressing the outer part of the air exhaust filter 210.

Accordingly, the air exhaust filter 210 in the filter assembly 200 can be replaced without disassembling the filter assembly 200.

10 As a result, with the aforementioned structure of the fourth embodiment, it is possible to completely open the side portion of the main body 100 to which the air is exhausted. Thus, the fine dusts contained in the exhausted air do not contact the air exhaust filter, and cleaning thereof is not necessary.

15 Additionally, the filter assembly 200, with which the fine dust contact, can be detached from the main body 100 of the vacuum cleaner. Therefore, for cleaning of the contaminated area, the filter assembly 200 can simply be detached and cleaned. Thus, various circuit substrates within the main body of the vacuum cleaner are safe from the problem such as the inflow of water thereto.

Meanwhile, while the device for exhausting of the present invention is 20 characterized in that it is formed at either one of the two portions at which the main body 100 and the wheel 160 are connected, the present invention is not limited

to this. That is, a plurality of exhaust holes may be provided at each sides of the main body and an air exhaust filter may be provided between the exhaust holes and the wheel, for efficient exhausting of air and collecting of the fine dusts contained in the exhausted air.

5        However, in the present invention, the device for exhausting is provided only at one side of the main body, so that the separate flow passage guide for guiding a direction of the air flow within the main body 100 can be formed with ease.

Accordingly, a separate supplementary air exhaust filter (not shown) is provided between the wheel connected to the opposite to the device for exhausting 10 and the side portion of the main body, for convenience of a user to replace the supplementary filter with a new one.

#### Industrial Applicability

As aforementioned, the device for exhausting in a vacuum cleaner in accordance with the present invention is not visible because it is hidden by the 15 wheels, and the air flown within the main body is exhausted through the wheels. Accordingly, the rear of the main body of the vacuum cleaner can be more practically used in view of the design of the vacuum cleaner.

Additionally, the air exhaust filter can be easily replaced by detaching only the wheels, thereby allowing easy operation of a user. At this instance, the wheels can 20 be detached more easily in accordance with each embodiment of the present invention, improving satisfaction of a user.

Accordingly, the present invention is usefully applicable industrially.

“THERE IS A NEED TO PROTECT

What is Claimed is:

1. A device for exhausting in a vacuum cleaner, comprising:
  - a main body for suction and collecting contaminants;
  - wheels rotatably mounted at both sides of the main body;
  - 5 an exhaust flow passage formed between the main body and the wheels, for discharging the air cleaned within the main body; and
  - an air exhaust filter provided at the exhaust flow passage for filtering fine dusts contained in the cleaned air once again.
2. The device as claimed in claim 1, wherein the exhaust flow passage is 10 formed by opening a portion of the main body at which the wheel is mounted, and the wheel.
3. The device as claimed in claim 1, wherein the wheel comprising:
  - a guiding member connected to a guiding projection formed at a side of the 15 main body, and having an air exhaust filter therein; and
  - a rolling member mounted around the guiding member for performing a rolling movement when contacting a ground.
4. The device as claimed in claim 3, characterized in that at least one locking hole is formed around the guiding projection, and a locking means such as a

protrusion or a hook is formed at an outer circumference of the guiding member locked to the locking hole, for fixing the wheel to the main body.

5. The device as claimed in claim 3, characterized in that a projected center axis is integrally formed at an inner center of the guiding projection at a side of the main body at which the exhaust holes are formed, to penetrate the air exhaust filter and the guiding member of the wheel, and a grip portion selectively connected to the center axis is mounted at an outer side of the guiding member of the wheel, to fix the guiding member to the guiding projection.

6. The device as claimed in claim 1, wherein the wheel comprising:  
10 a rolling member rotatably connected to an outer circumference of the guiding member formed at a side of the main body, for performing a rolling movement when contacting a ground; and  
a filter assembly mounted at the outside of the guiding projection and having an air exhaust filter therein for removing fine dusts contained in the air, for  
15 supporting the rolling member to prevent detachment thereof.

7. The device as claimed in claim 6, wherein the filter assembly comprising:  
a center axis formed at the inner center to penetrate and support the air exhaust filter;

a guiding member located at outside of the air exhaust filter to prevent detachment of the air exhaust filter; and

a grip portion selectively connected to the center axis for fixing the guiding member to the guiding projection.

5 8. The device as claimed in one of claims 5 or 7, wherein the guiding member and the grip portion are separately formed and are integrated.

9. The device as claimed in one of claims 5 or 7, wherein the guiding member and the grip portion are integrally formed.

10. The device as claimed in claim 8, wherein an end portion of the center axis which is projected outwardly of the guiding member is formed as a cylindrical shape having an empty space therein, and locking portions are integrally formed along an inner circumference of the inner circumference facing each other, to be projected inwardly of the center axis, and

15 a connecting axis which is inserted to inside of the center axis is formed at the grip portion, provided with locking protrusions which is locked to the locking portion of the center axis when the connecting axis is inserted to the center axis for preventing detachment thereof.

11. The device as claimed in claim 10, wherein each locking protrusion of the grip portion has an inclined surface whose width becomes narrow toward the a rear of the grip portion.

12. The device as claimed in claim 10, wherein a separate packing member  
5 is formed on the connecting axis between an inner wall of the guiding member and the locking protrusion of the grip portion, for sealing a gap therebetween.

13. The device as claimed in claim 10, wherein a grip portion protrusion is formed at a rear side of the grip portion which is exposed externally, having a shape of "+", "Λ" or "I".

10 14. The device as claimed in claim 7, wherein an end portion of the center axis which is projected outwardly of the guiding member is formed as a cylindrical shape having an empty space therein, and locking portions are integrally formed along an inner circumference of the inner circumference facing each other, to be projected inwardly of the center axis, and

15 a connecting axis which is inserted to inside of the center axis is formed at the grip portion, provided with locking protrusions which is locked to the locking portion of the center axis when the connecting axis is inserted to the center axis for preventing detachment thereof.

15. The device as claimed in claim 14, wherein each locking protrusion of the grip portion has an inclined surface whose width becomes narrow toward a rear of the grip portion.

16. The device as claimed in claim 14, wherein a separate packing member 5 is formed on the connecting axis between an inner wall of the guiding member and the locking protrusion of the grip portion, for sealing a gap therebetween.

17. The device as claimed in claim 14, wherein a grip portion protrusion is formed at a rear side of the grip portion which is exposed externally, having a shape of "+", "Λ" or "I".

10 18. The device as claimed in claim 8, wherein a plurality of screw threads are formed at an outer circumference of an end portion which is projected outwardly of the guiding member, and a projected connecting axis including a screw thread formed along its outer circumference is formed at the grip portion, to connect the center axis and the grip portion as a screw connection.

15 19. The device as claimed in claim 18, wherein a grip portion protrusion is formed at a rear side of the grip portion which is exposed externally, having a shape of "+", "Λ" or "I".

20. The device as claimed in claim 9, wherein a plurality of screw threads are formed at an outer circumference of an end portion which is projected outwardly of the guiding member, and a projected connecting axis including a screw thread formed along its outer circumference is formed at the grip portion, to connect the center axis 5 and the grip portion in a screwed type.

21. The device as claimed in claim 20, wherein a grip portion protrusion is formed at a rear side of the grip portion which is exposed externally, having a shape of "+", "Λ" or "I".

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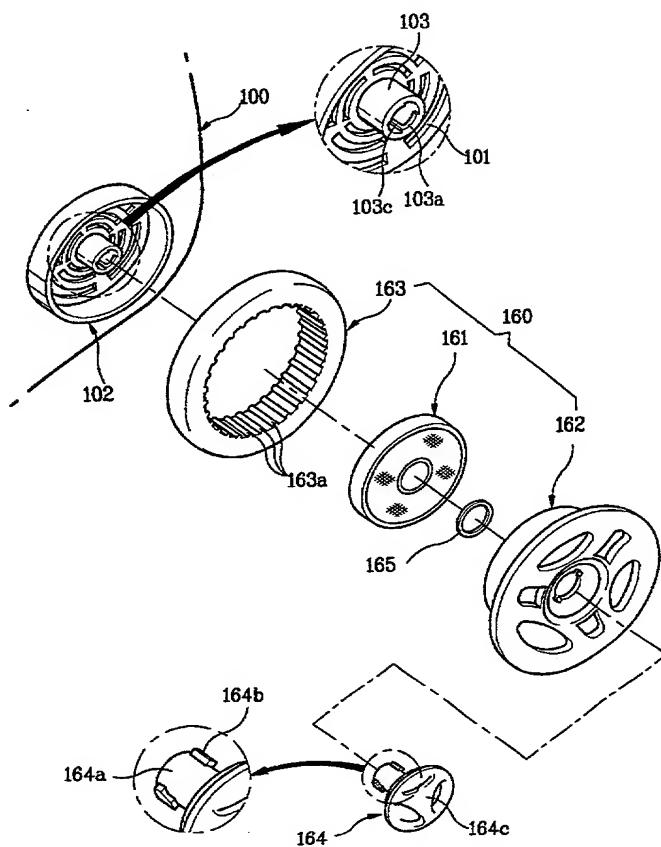
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(72) Inventors; and  
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[Continued on next page]

(54) Title: DEVICE FOR EXHAUSTING IN VACUUM CLEANER

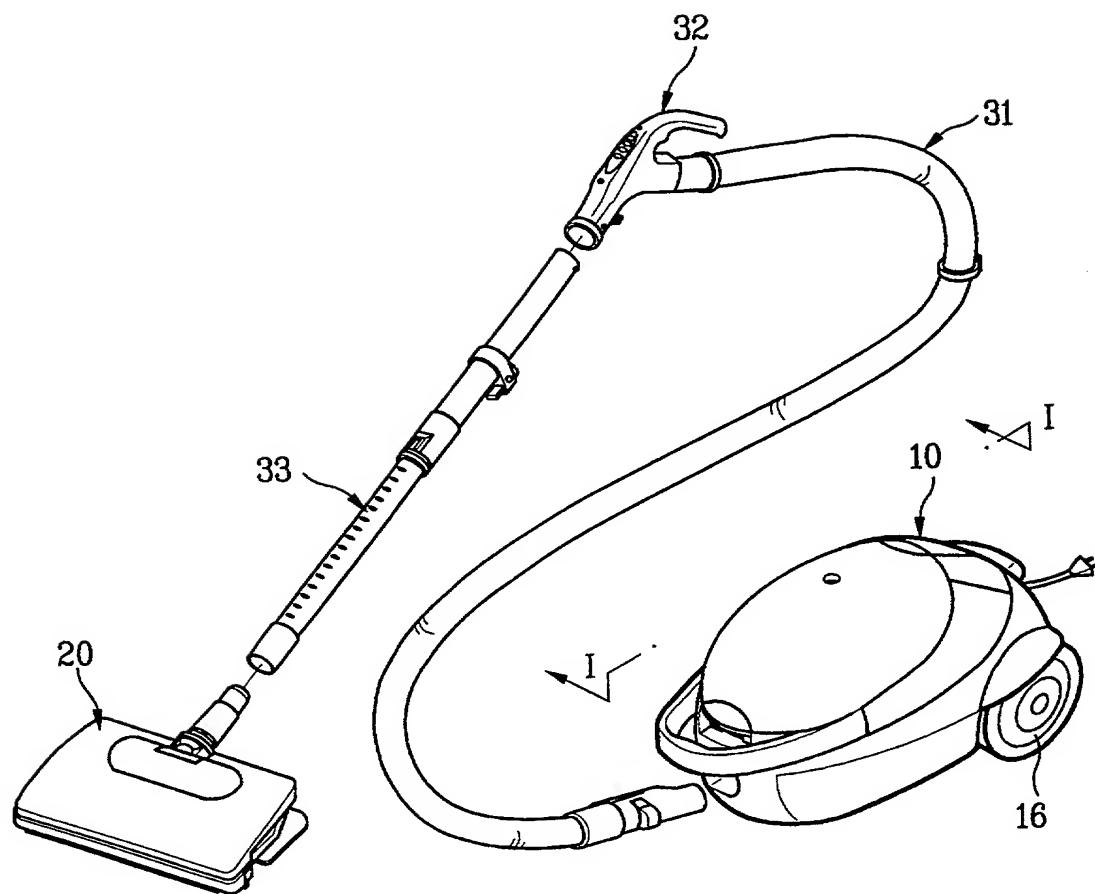


(57) Abstract: A device for exhausting in a vacuum cleaner is disclosed, whose air exhaust filter which collects fine dusts contained in air exhausted to outside of a main body of the vacuum cleaner can be easily replaced, and which reduces a visual discomfort of a user by hiding the exhaust holes through which air is exhausted to outside of the main body. The device for exhausting in a vacuum cleaner includes a main body (100) for suction and collecting of various contaminants, wheels (160) rotatably mounted at both sides of the main body (100), an exhaust flow passage formed between the main body and the wheels, for discharging the air cleaned inside the main body, and an air exhaust filter (161) provided at the exhaust flow passage for filtering the fine dusts contained in the exhausted air once again.

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FIG. 1



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FIG. 2

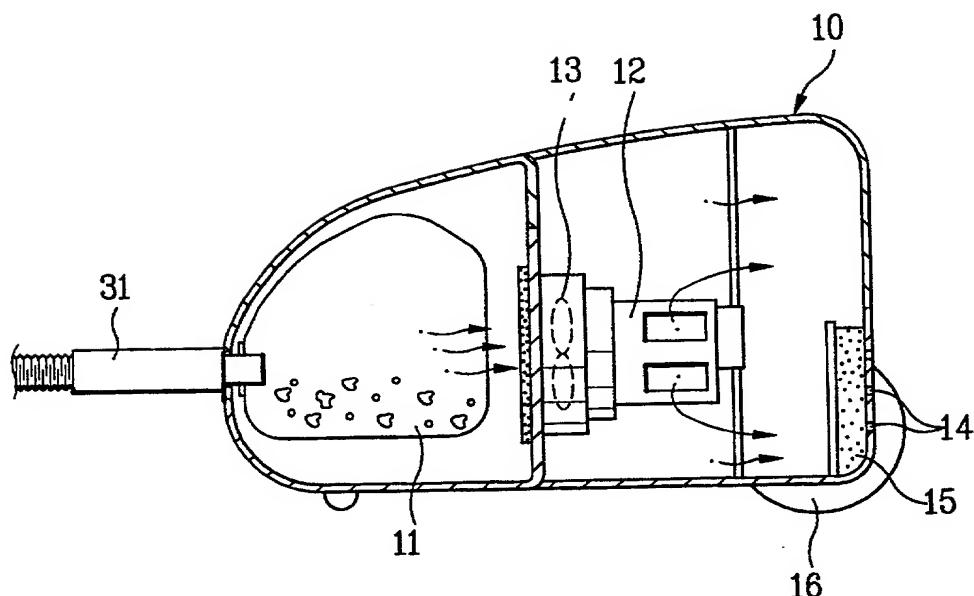
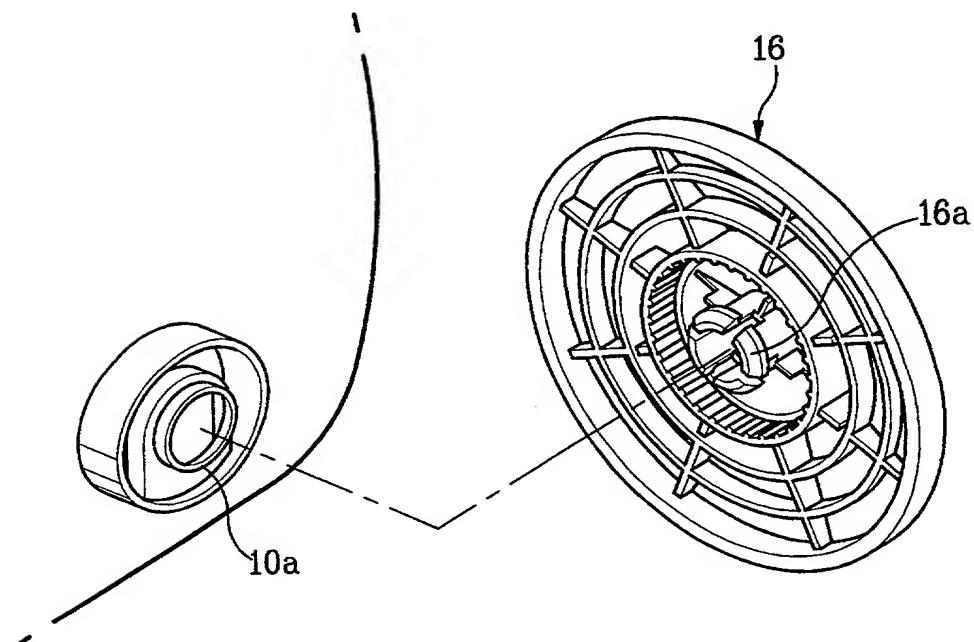
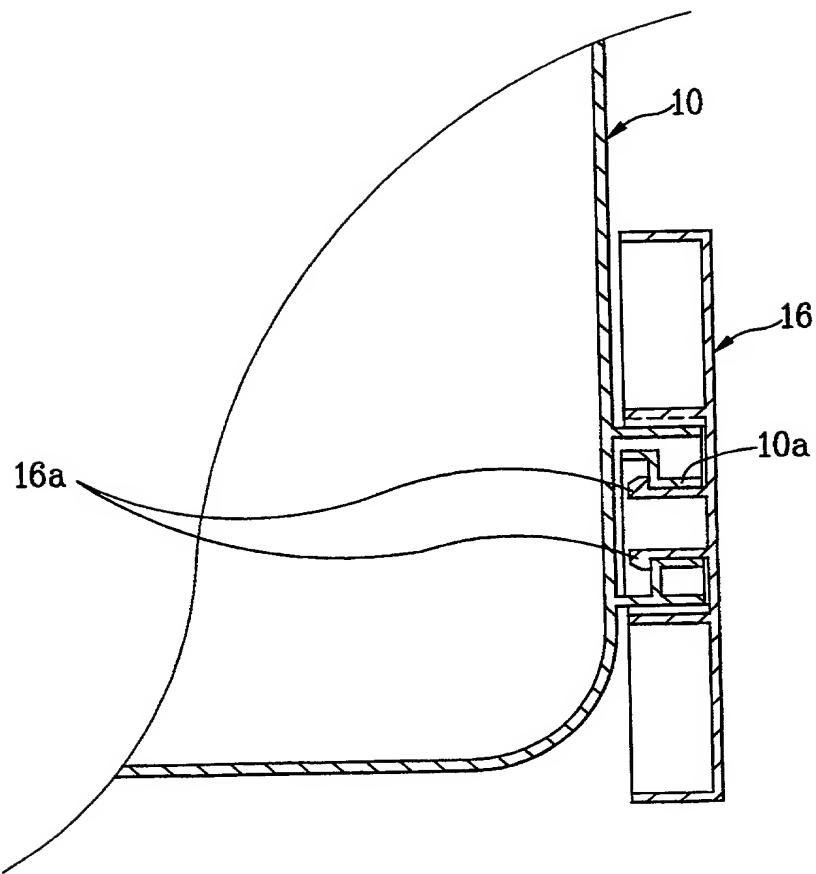


FIG. 3



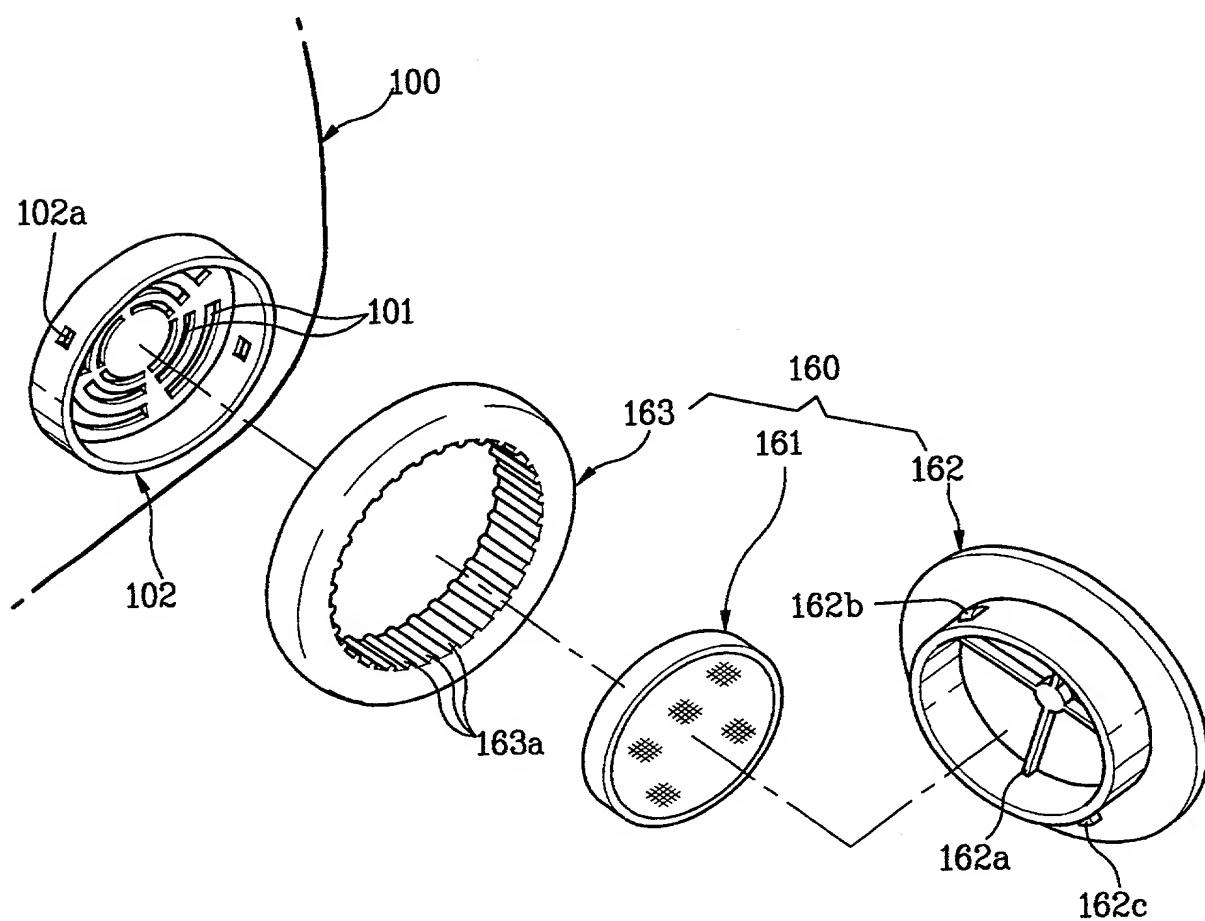
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FIG. 4



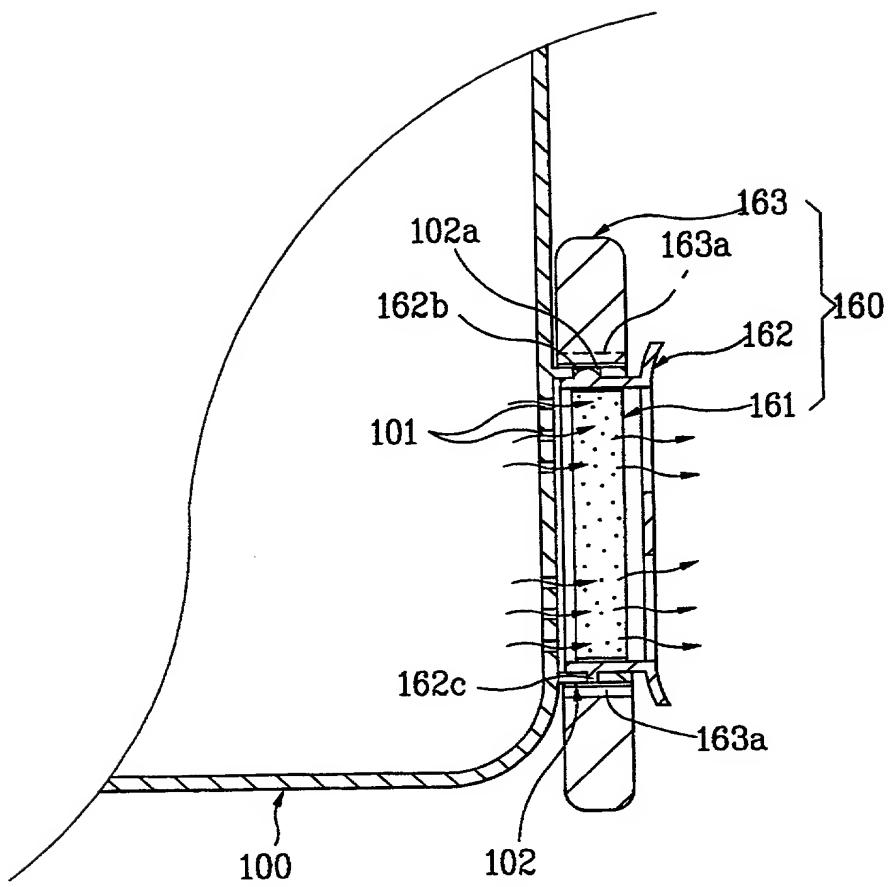
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FIG. 5



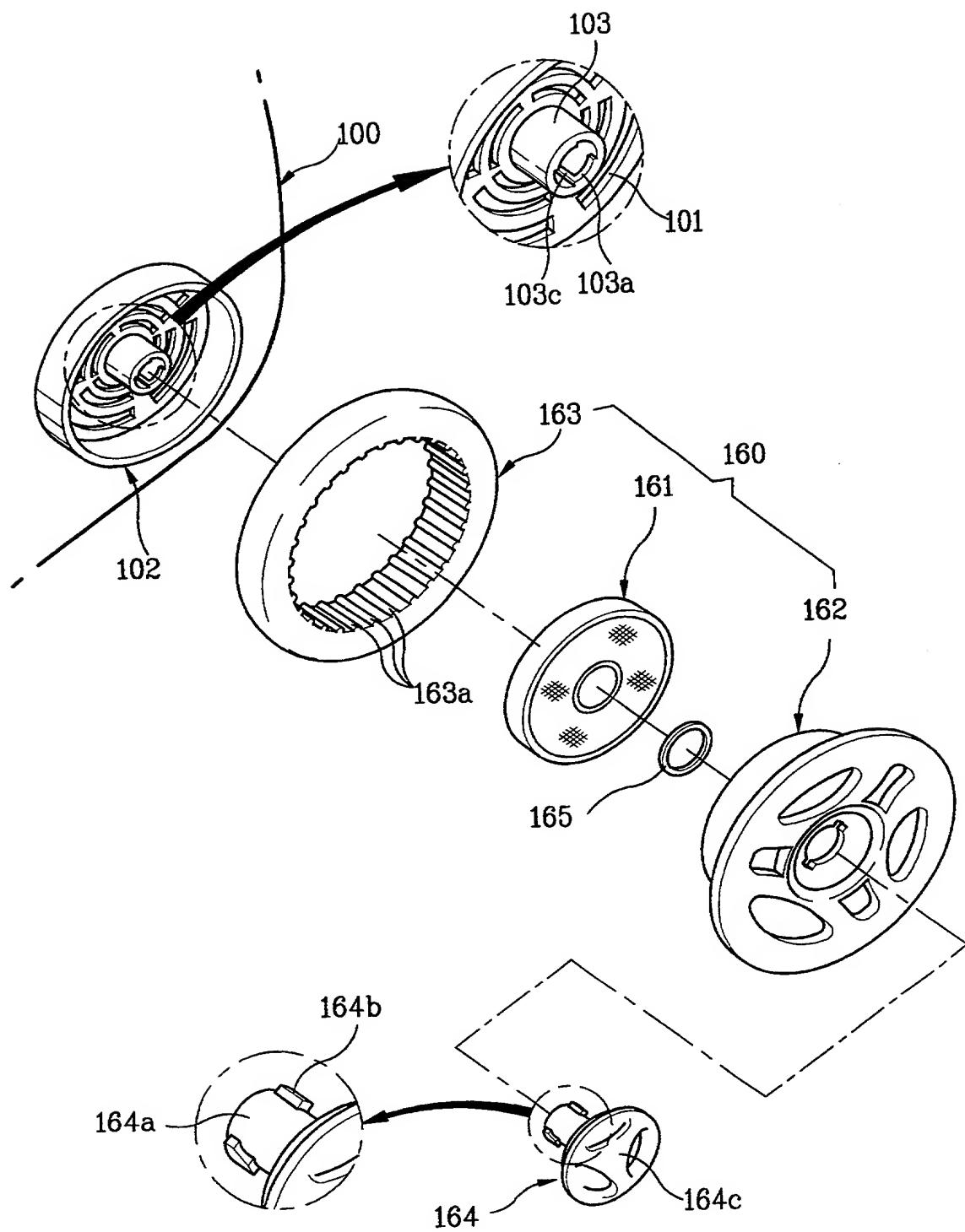
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FIG. 6



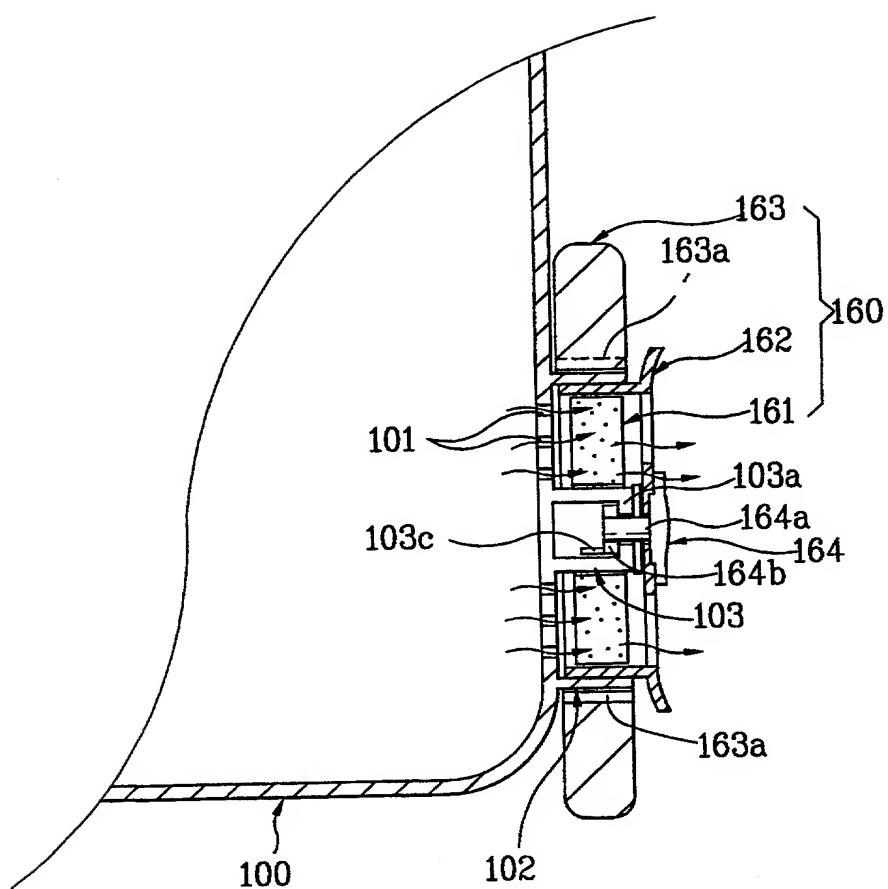
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FIG. 7



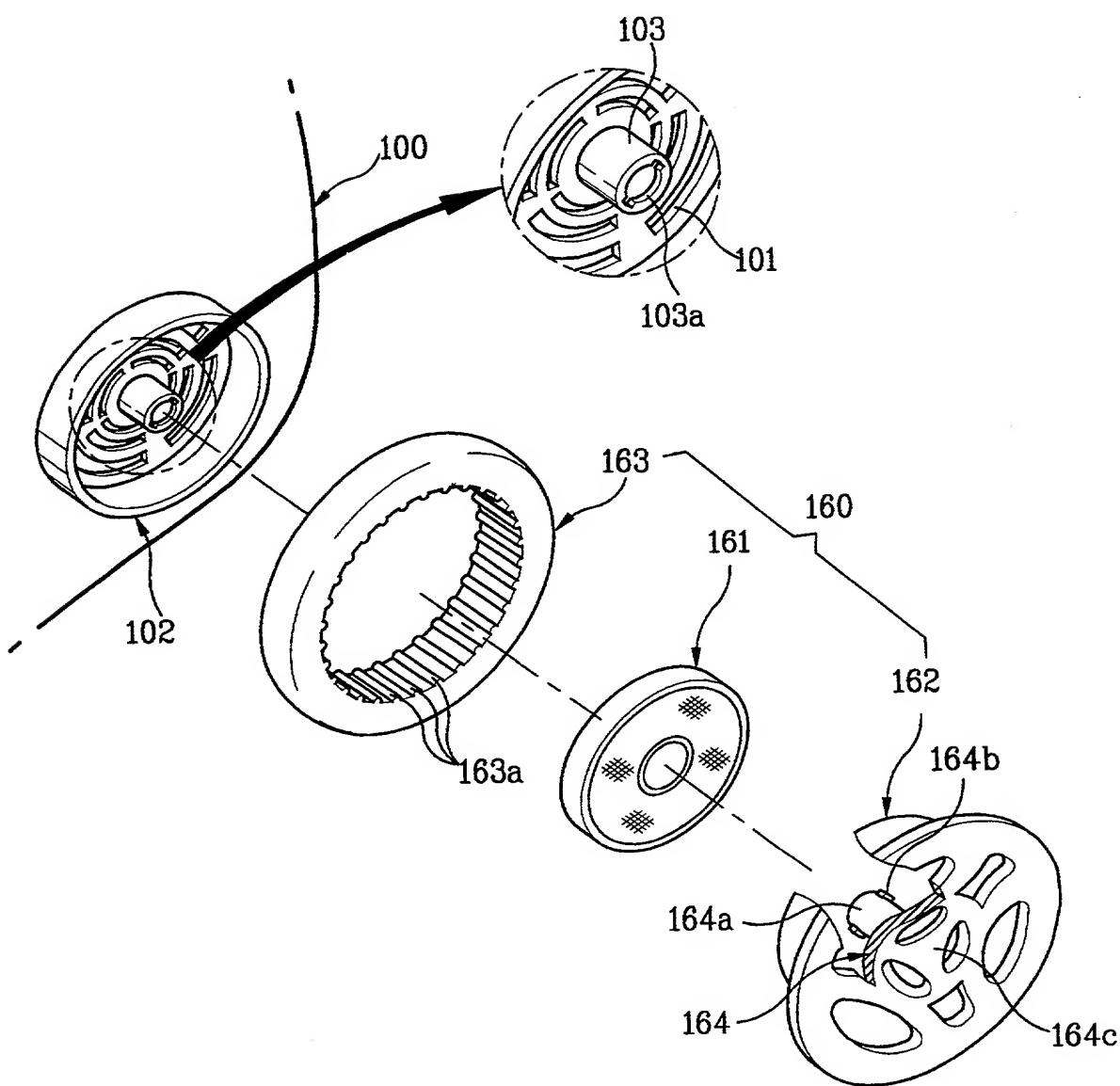
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FIG. 8



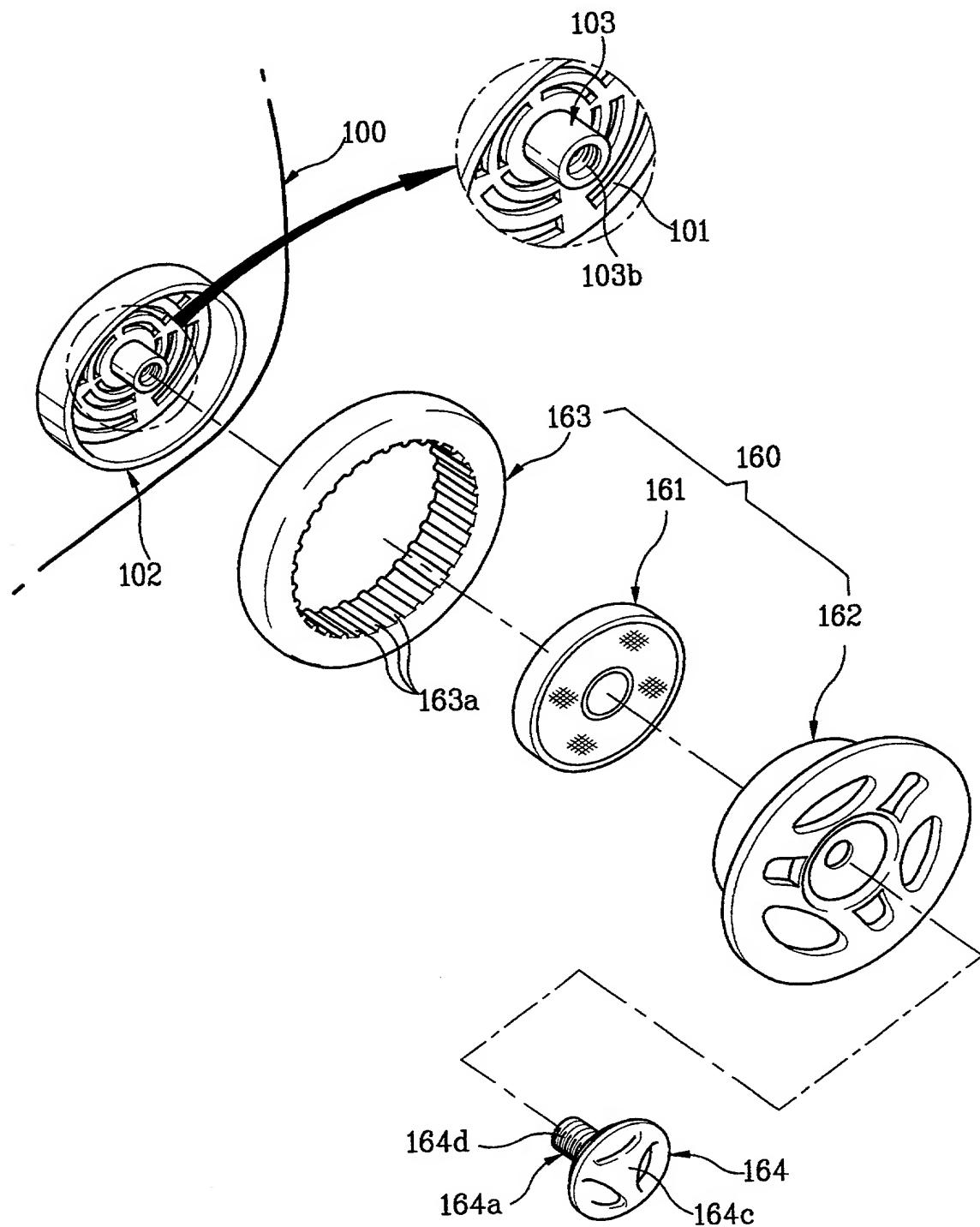
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FIG. 9



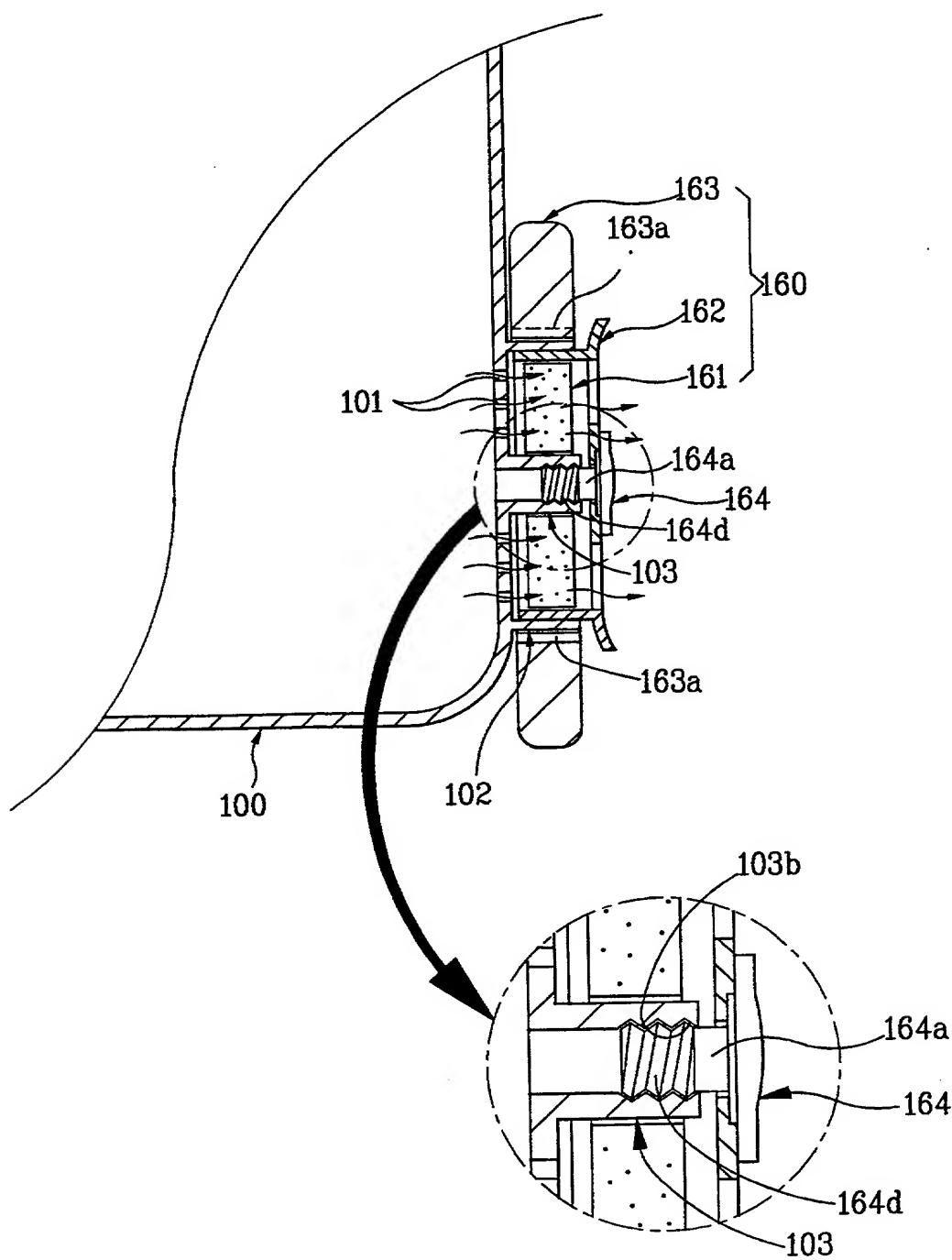
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FIG. 10



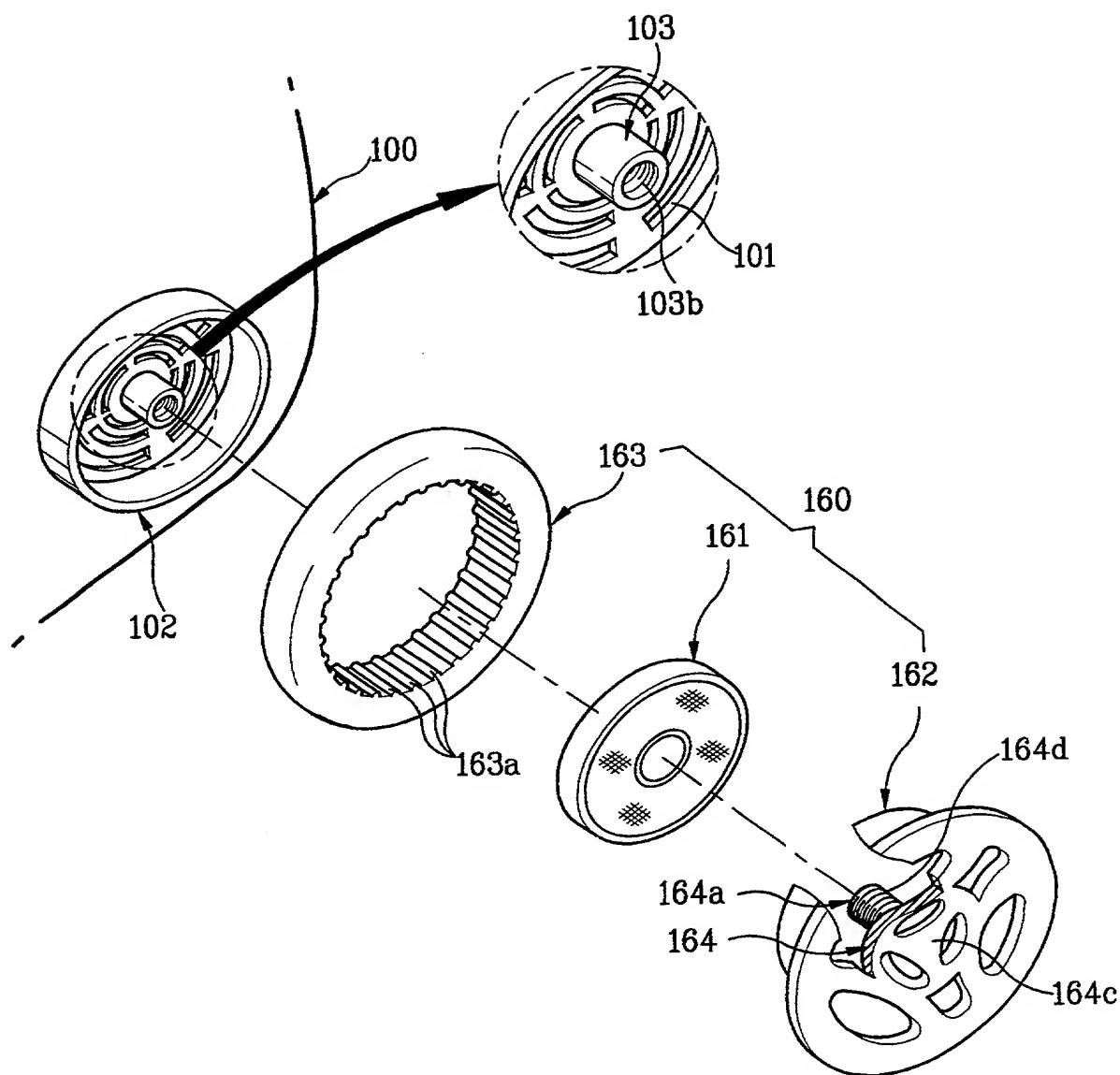
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FIG. 11



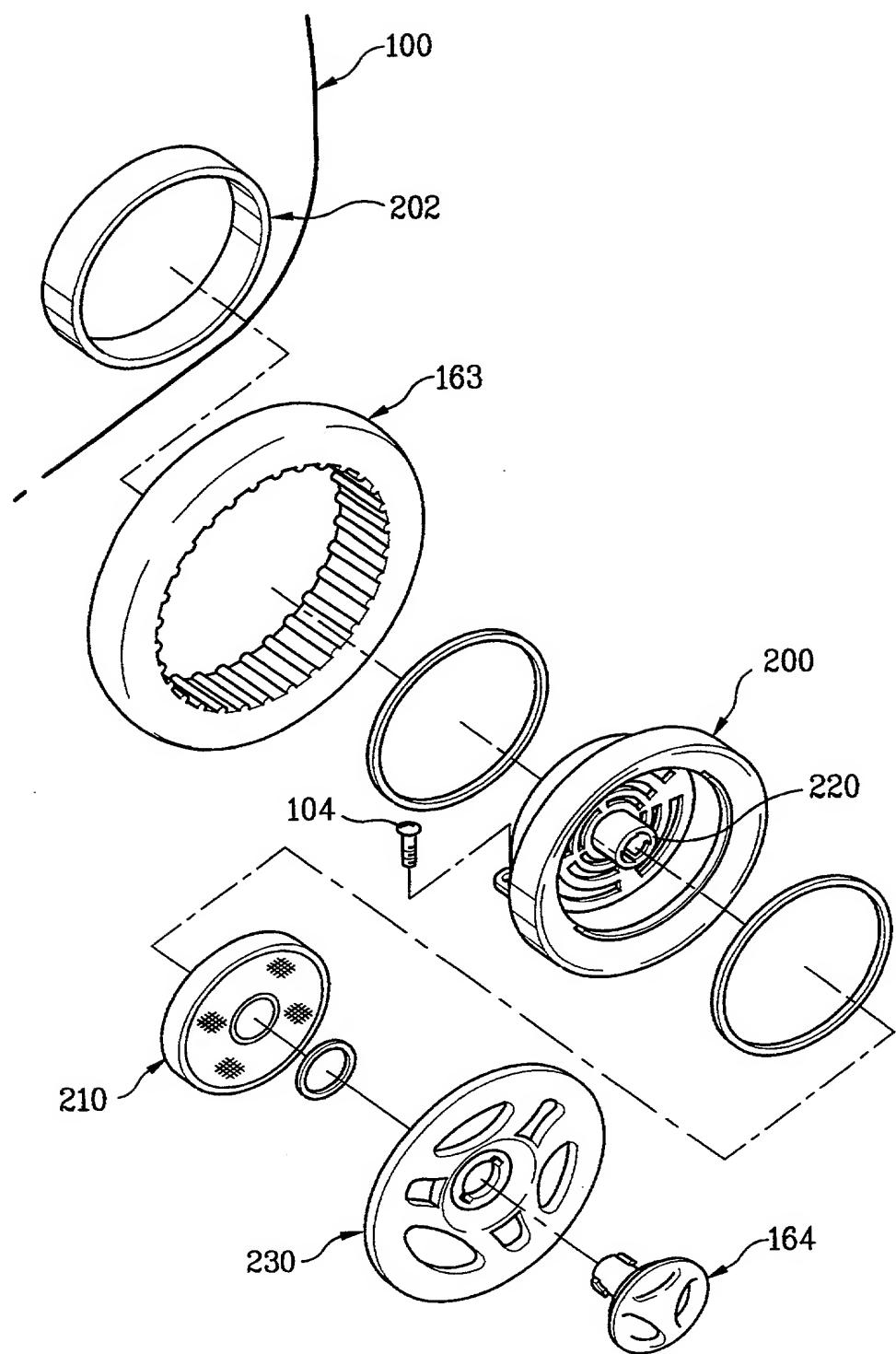
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FIG. 12



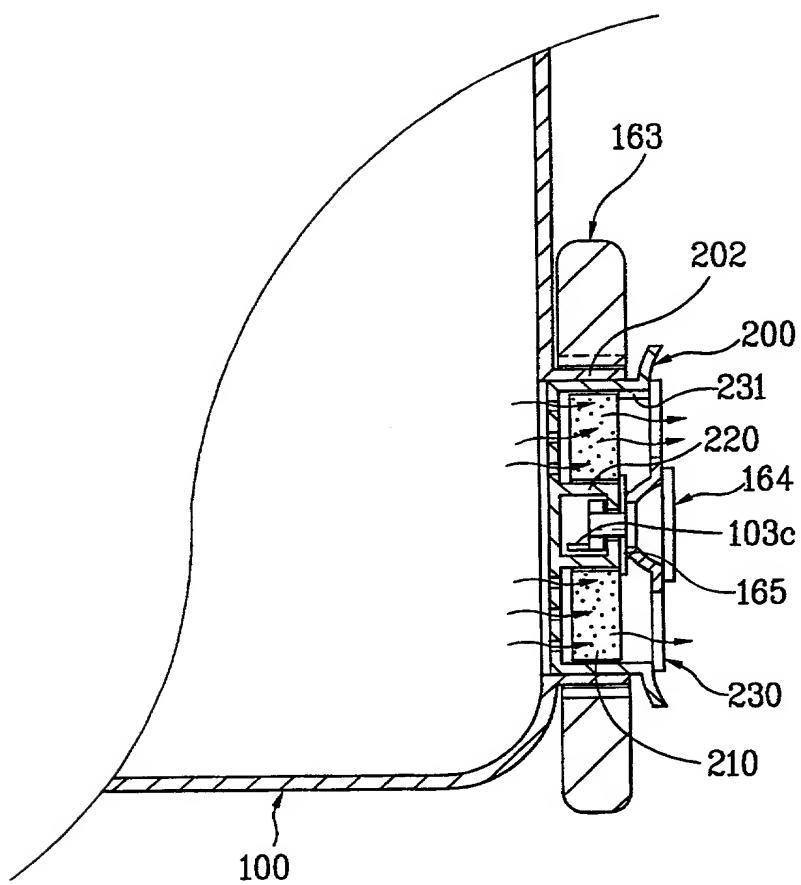
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FIG. 13



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FIG. 14



# DECLARATION AND POWER OF ATTORNEY

Atty. Dkt. No.: 04650-000101

## DECLARATION

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DEVICE FOR EXHAUSTING IN VACUUM CLEANER

the specification of which (check one)

is attached hereto.  
or  
 was filed on \_\_\_\_\_ as Application Serial No. or PCT International Application No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. §§ 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)				
APPN. SERIAL NO.	COUNTRY	DATE FILED (MM/DD/YYYY)	PRIORITY CLAIM	
			Yes	No
P1999-39932	Korea	09/16/1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>
P2000-1214	Korea	01/11/2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>
P2000-11580	Korea	03/08/2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>

# DECLARATION AND POWER OF ATTORNEY

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

PRIOR PROVISIONAL APPLICATION(S)	
APPN. SERIAL NO.	DATE FILED (MM/DD/YYYY)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below:

PRIOR U.S. APPLICATION(S)		
APPN. SERIAL NO.	DATE FILED (MM/DD/YYYY)	STATUS - PATENTED, PENDING, ABANDONED

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## POWER OF ATTORNEY

I hereby appoint the following attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

5  
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John A. Castellano      Reg. No. 35,094  
Terry L. Clark      Reg. No. 32,644  
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# DECLARATION AND POWER OF ATTORNEY

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Citizenship: Republic of Korea

Mailing Address: \_\_\_\_\_

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Citizenship: Republic of Korea

Mailing Address:

**Full name of fifth joint inventor, if any:**

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Date: \_\_\_\_\_

Residence:

Citizenship: Republic of Korea

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